FIG. 1(a)

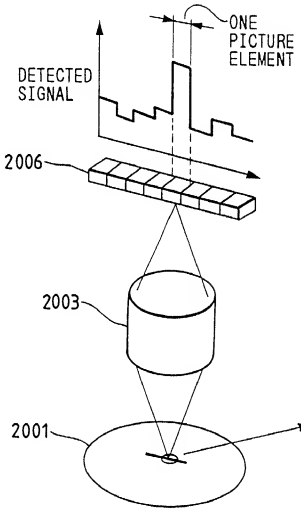


FIG. 1(c)

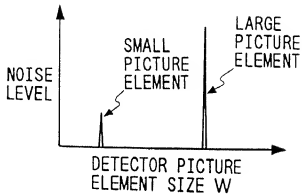


FIG. 1(b)

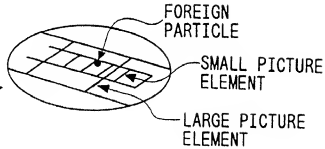


FIG. 2

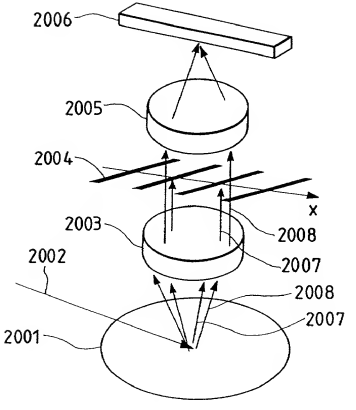

2006
2005
2004
x
2003
2008
2002
2007
2008
2007
2001

FIG. 3

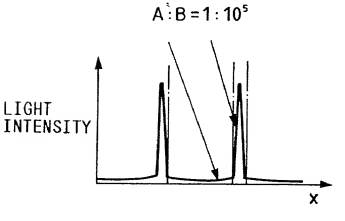

A : B = 1 : 10^5
LIGHT INTENSITY
x

FIG. 4

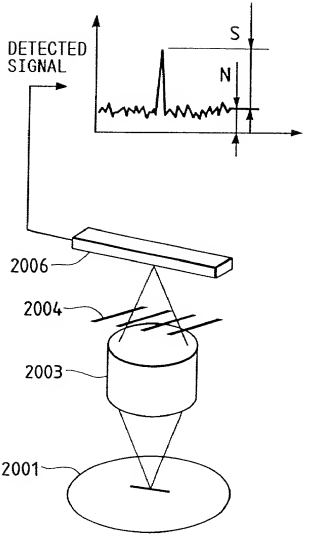


FIG. 5

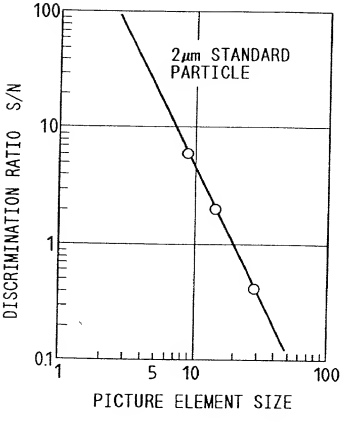

100
10
1
0.1
1
5
10
100
2μm STANDARD PARTICLE
DISCRIMINATION RATIO S/N
PICTURE ELEMENT SIZE

FIG. 6

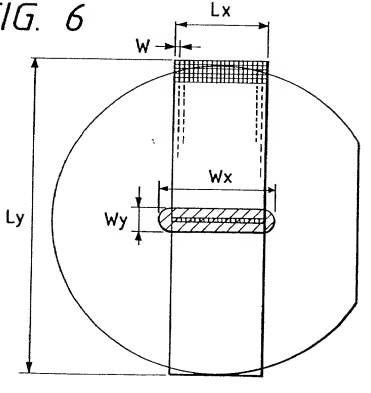

Lx
W
Wx
Wy
Ly

FIG. 7(a)

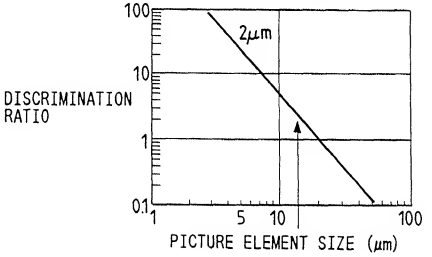


FIG. 7(b)

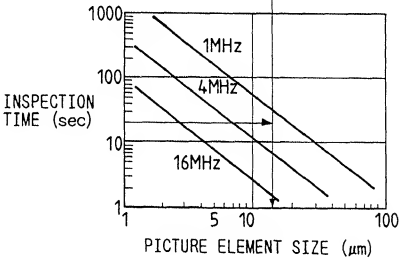


FIG. 7(c)

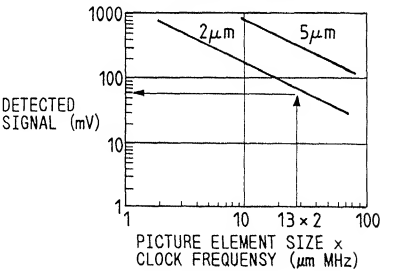


FIG. 8

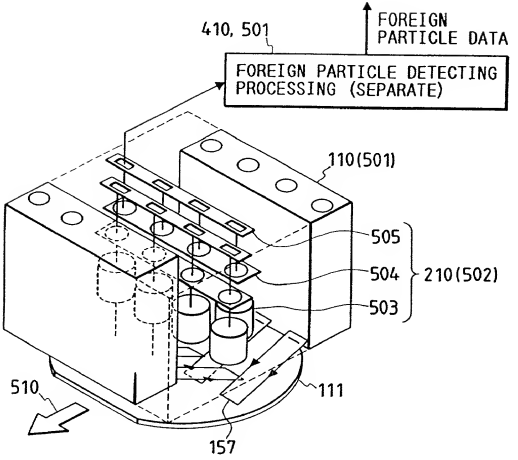

410, 501
FOREIGN PARTICLE DATA
FOREIGN PARTICLE DETECTING PROCESSING (SEPARATE)
110(501)
505
504
503
210(502)
510
111
157

FIG. 9(a)

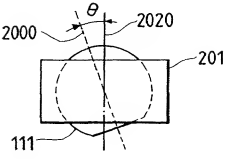

θ
2000
2020
201
111

FIG. 9(b)

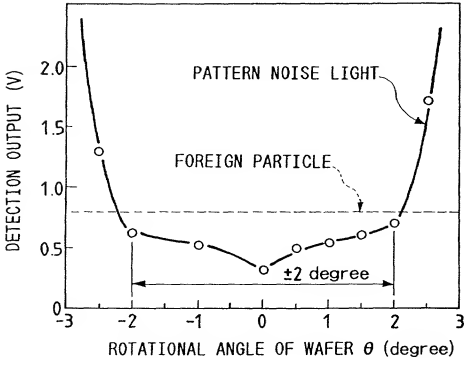

PATTERN NOISE LIGHT
FOREIGN PARTICLE
±2 degree
DETECTION OUTPUT (V)
2.0
1.5
1.0
0.5
0
-3
-2
-1
0
1
2
3
ROTATIONAL ANGLE OF WAFER θ (degree)

FIG. 10(a)

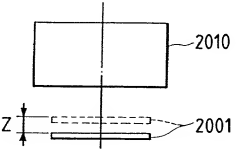


FIG. 10(b)

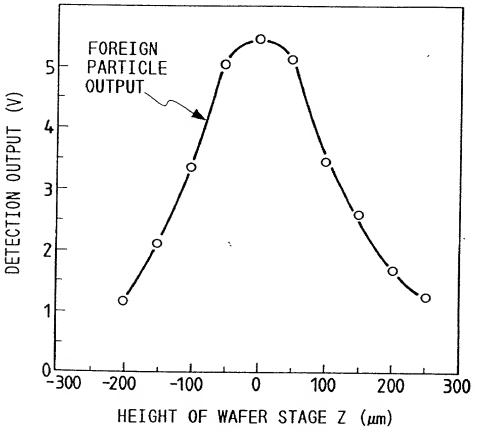


FIG. 11(a)

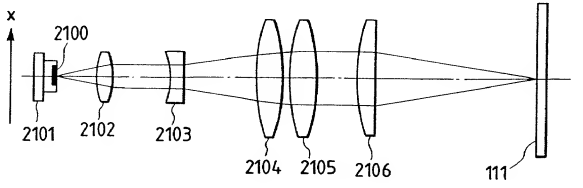


FIG. 11(b)

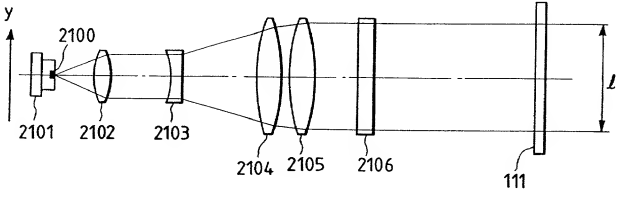


FIG. 12(a)

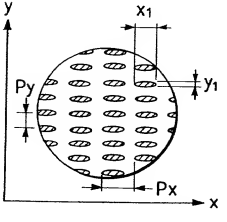


FIG. 12(b)

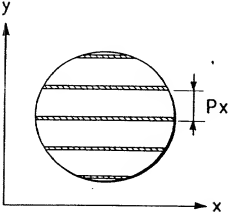


FIG. 13(a)

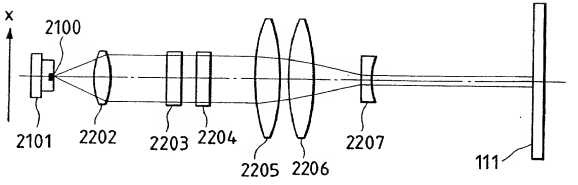


FIG. 13(b)

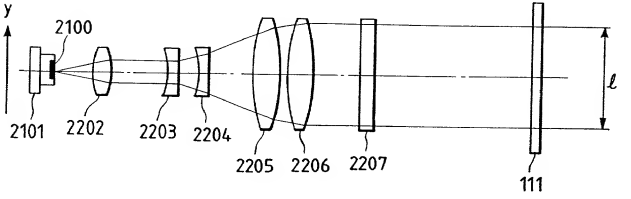


FIG. 14

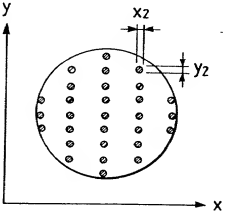


FIG. 15

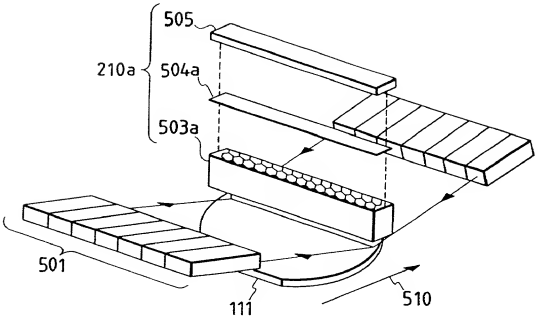
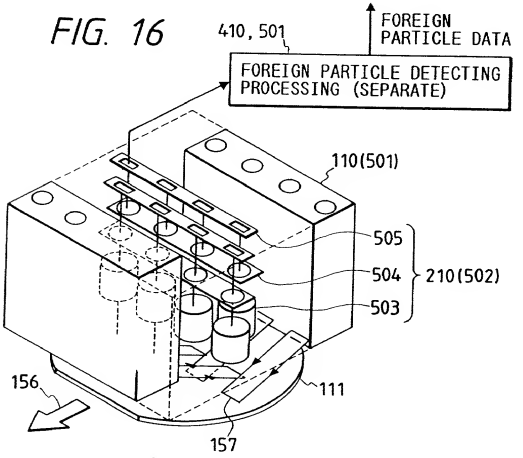

505
210a
504a
503a
501
111
510

FIG. 16


410, 501
FOREIGN PARTICLE DATA
FOREIGN PARTICLE DETECTING PROCESSING (SEPARATE)
110(501)
505
504
503
210(502)
156
111
157

TOKYO 9316960

FIG. 17(a)

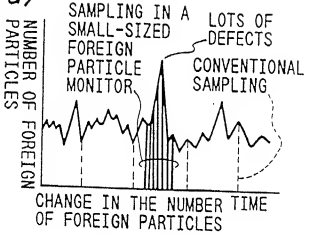


FIG. 17(b)

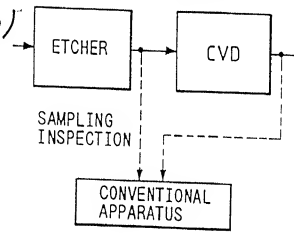


FIG. 17(c)

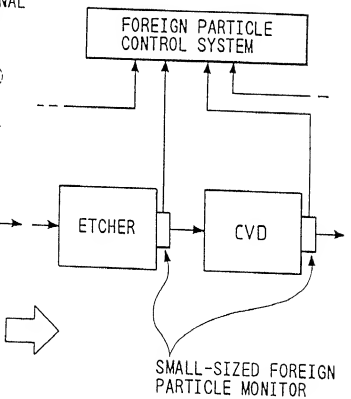
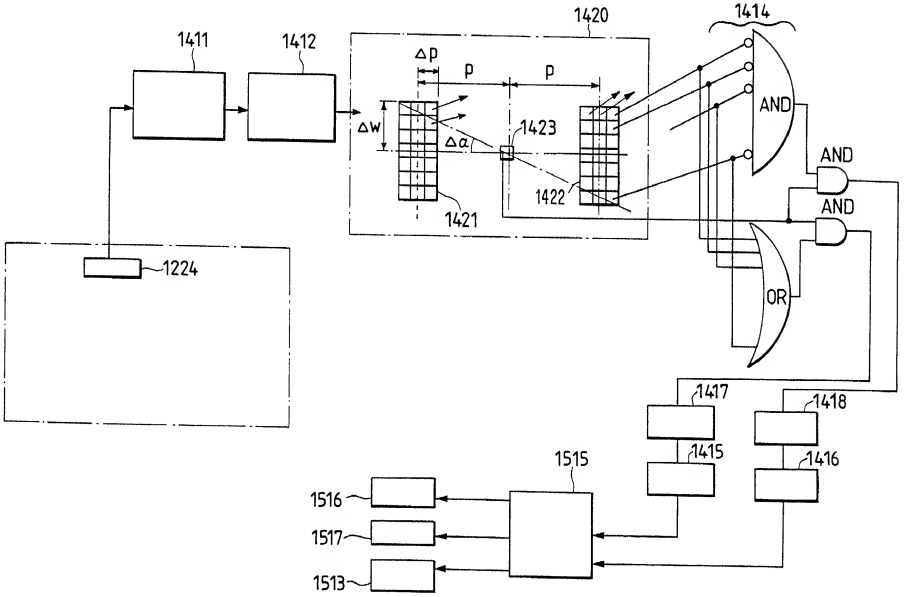


FIG. 18


1411
1412
1420
1414
Δp
p
p
Δw
Δα
1423
1421
1422
AND
AND
AND
OR
1224
1417
1418
1415
1416
1515
1516
1517
1513

POSITA-SOFTWARE

FIG. 19

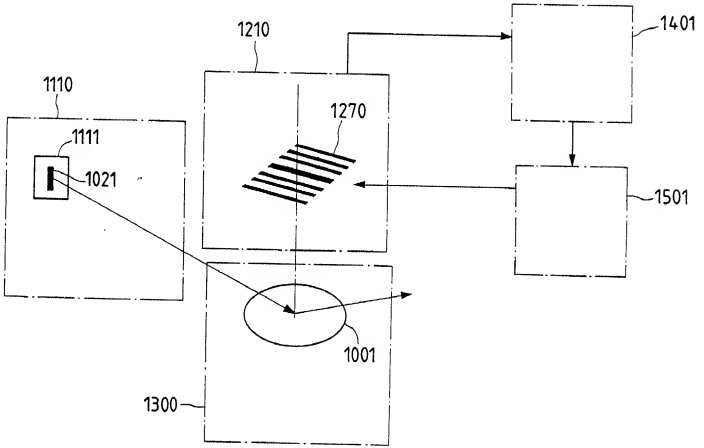


FIG. 20

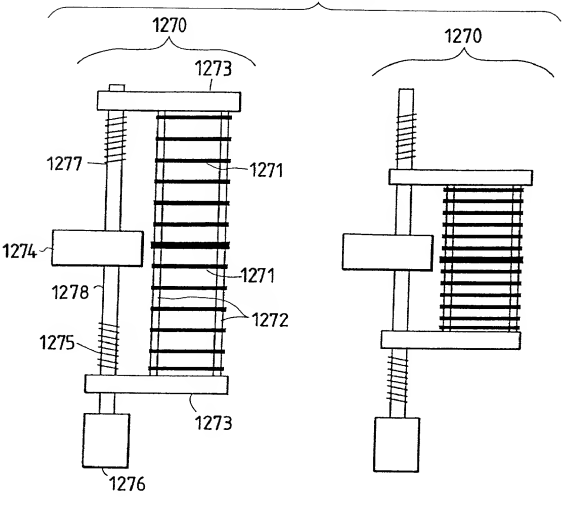

1270
1273
1277
1271
1274
1271
1278
1272
1275
1273
1276
1270

FIG. 21

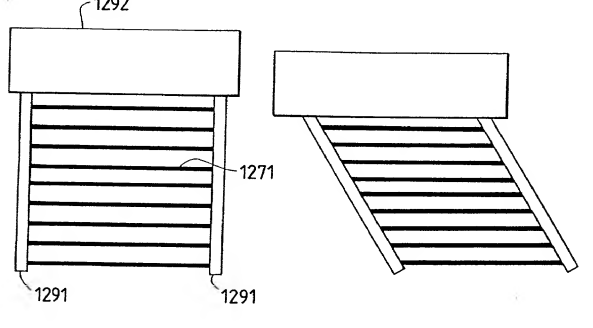

1292
1271
1291
1291

FIG. 22

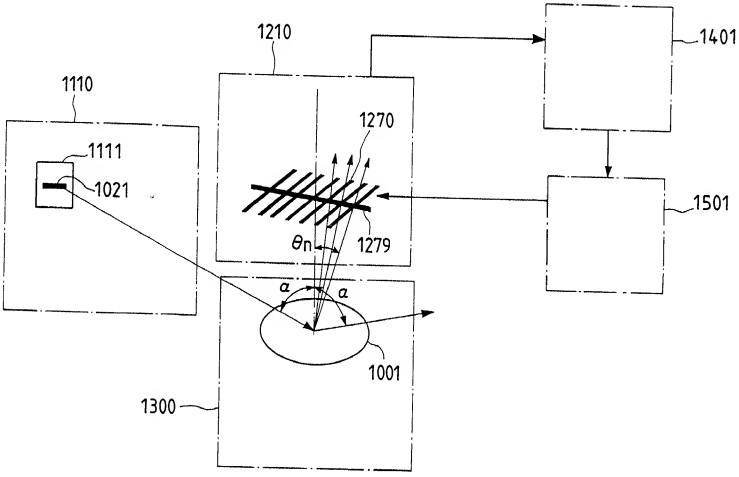


FIG. 23

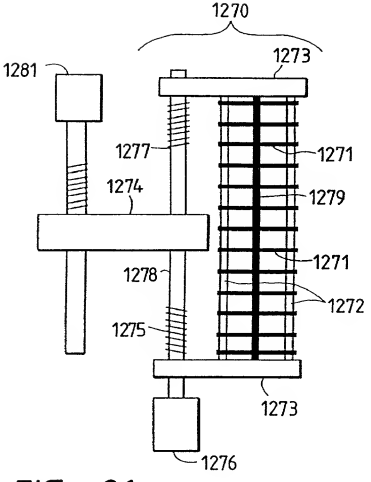
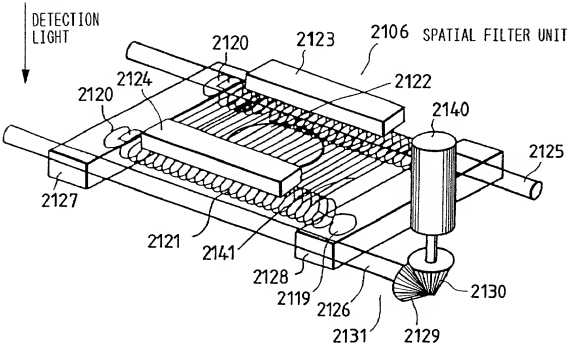
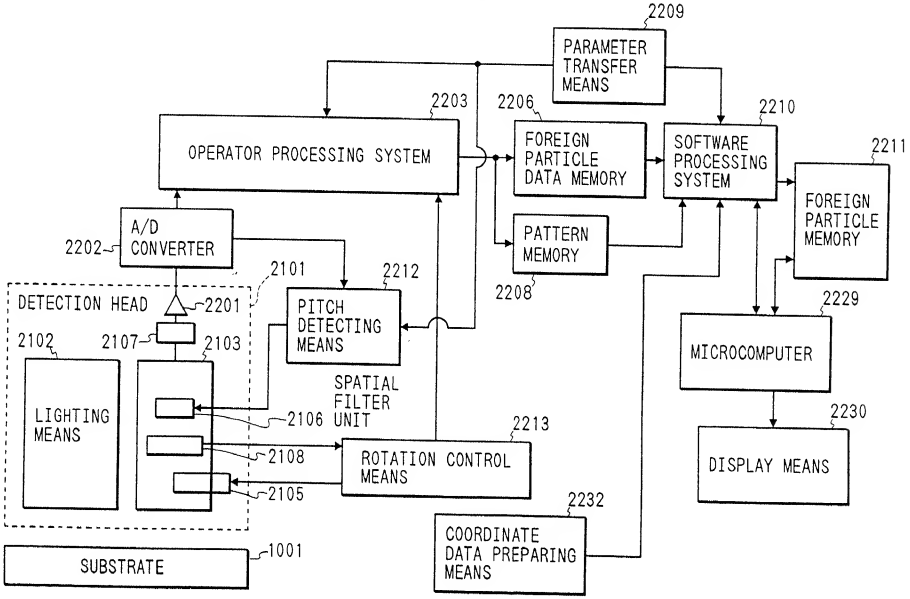

1270
1273
1281
1277
1271
1274
1279
1271
1278
1272
1275
1273
1276

FIG. 26


DETECTION LIGHT
2120
2123
2106
SPATIAL FILTER UNIT
2124
2122
2120
2140
2125
2127
2121
2141
2128
2119
2126
2130
2131
2129

TOKYO-2010050

FIG. 24



FUJITSU QUESTIONER

FIG. 25(a)

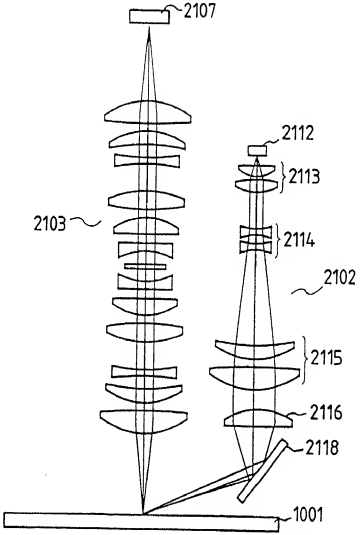


FIG. 25(b)

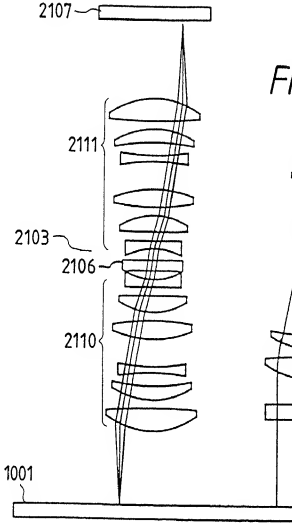


FIG. 25(c)

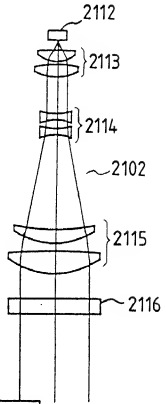


FIG. 27

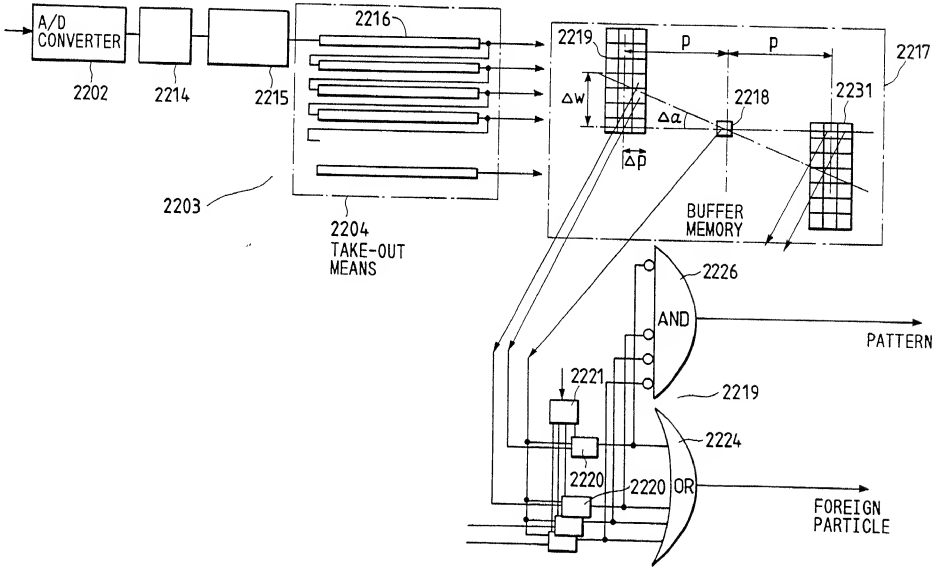

A/D CONVERTER
2202
2214
2215
2216
2203
2204
TAKE-OUT MEANS
2219
p
p
2217
Δw
2218
Δα
2231
Δp
BUFFER MEMORY
2226
AND
PATTERN
2221
2219
2224
2220
2220
OR
FOREIGN PARTICLE

FIG. 28

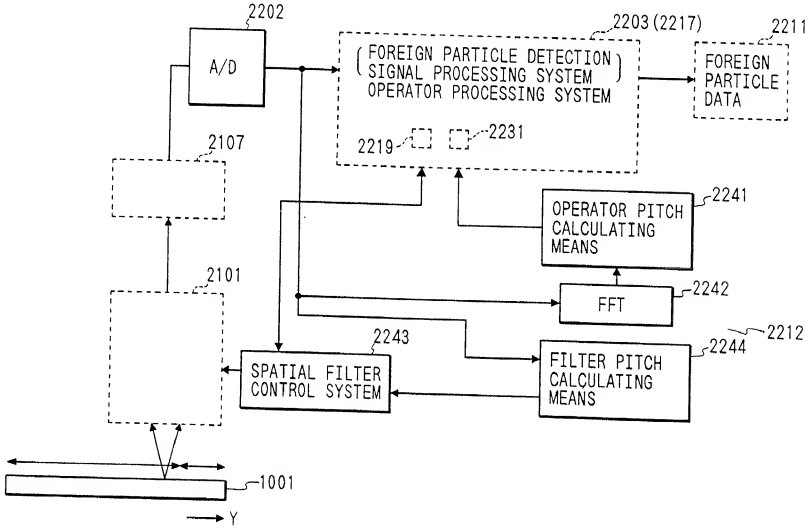

2202
A/D
2203 (2217)
FOREIGN PARTICLE DETECTION SIGNAL PROCESSING SYSTEM OPERATOR PROCESSING SYSTEM
2211
FOREIGN PARTICLE DATA
2219
2231
2107
2241
OPERATOR PITCH CALCULATING MEANS
2101
FFT
2242
2212
2243
2244
SPATIAL FILTER CONTROL SYSTEM
FILTER PITCH CALCULATING MEANS
1001
Y

FIG. 29(a) PRIOR ART

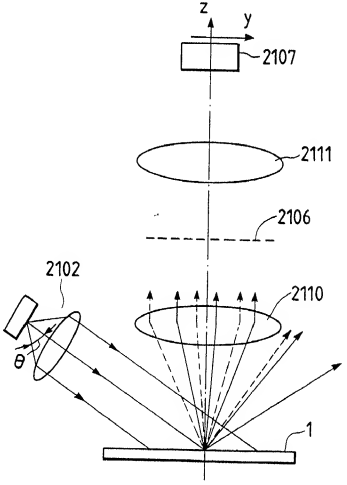


FIG. 29(b) PRIOR ART

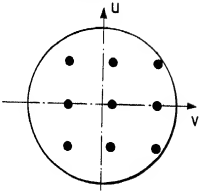


FIG. 29(c) PRIOR ART

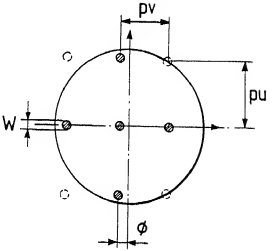


FIG. 30(a)

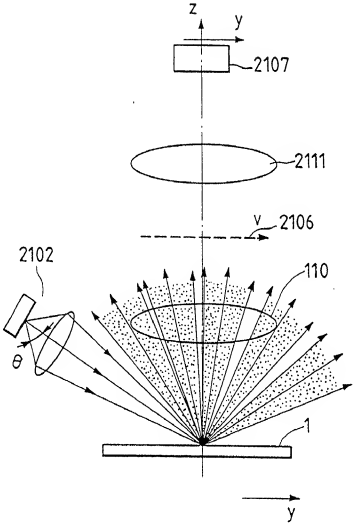


FIG. 30(d)

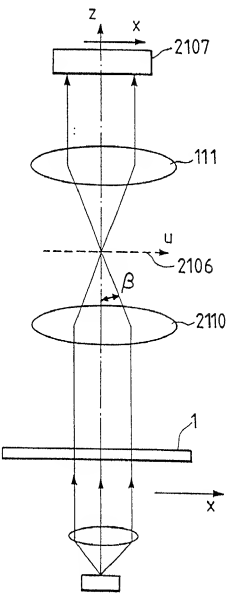


FIG. 30(b)

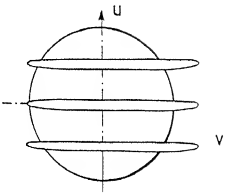


FIG. 30(c)

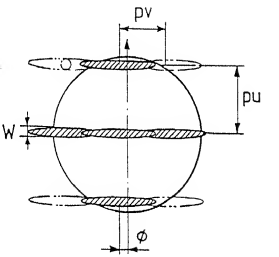


FIG. 31(a)

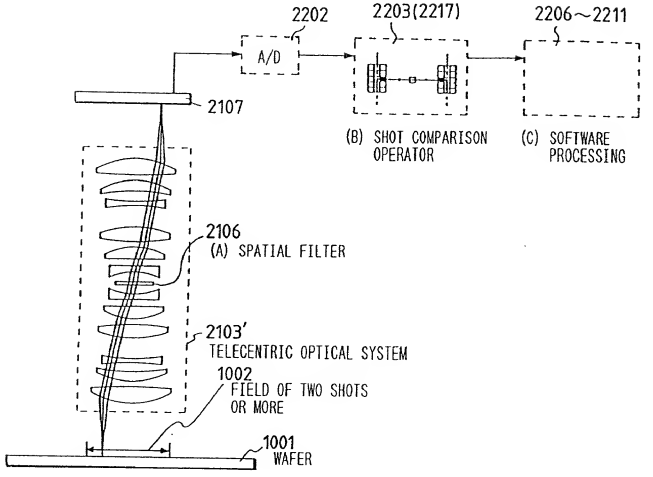
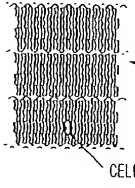


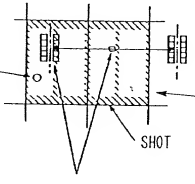
FIG. 31(b)(1)



(1) ERASING OF PATTERN USING SPATIAL FILTER

ERASE THE REPEATABILITY OF CELL USING SPATIAL FILTER

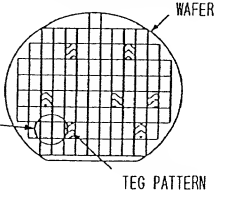
FIG. 31(b)(2)



(2) ERASING OF PATTERN USING SHOT COMPARISON OPERATOR

ERASE USING THE REPEATABILITY OF TWO SHOTS

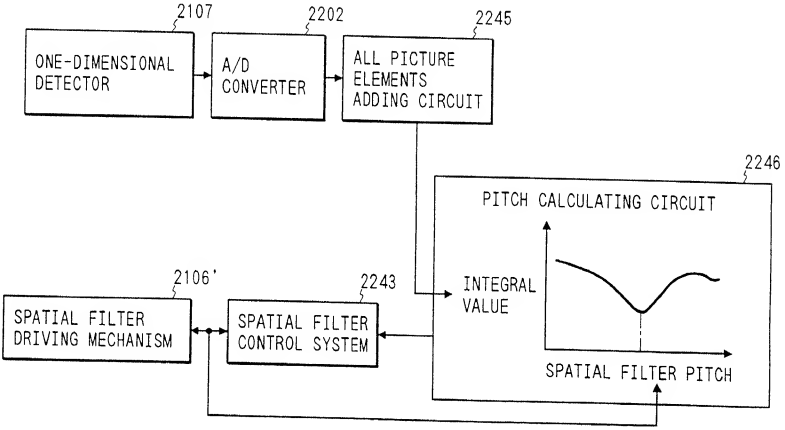
FIG. 31(b)(3)



(3) ERASING OF TEG PATTERN USING SOFTWARE

ERASE USING COORDINATE-MATRIX DATA

FIG. 32


2107
ONE-DIMENSIONAL DETECTOR
2202
A/D CONVERTER
2245
ALL PICTURE ELEMENTS ADDING CIRCUIT
2246
PITCH CALCULATING CIRCUIT
INTEGRAL VALUE
SPATIAL FILTER PITCH
2106'
SPATIAL FILTER DRIVING MECHANISM
2243
SPATIAL FILTER CONTROL SYSTEM

FOLDED, SPINDLED

FIG. 33(a)

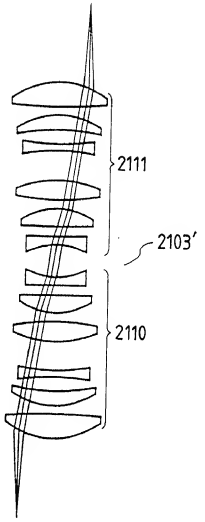
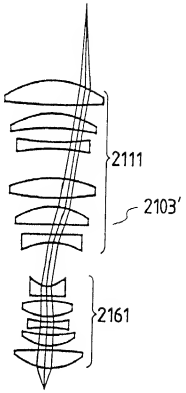


FIG. 33(b)



TOKTCD: 98TC00060

FIG. 34(a)

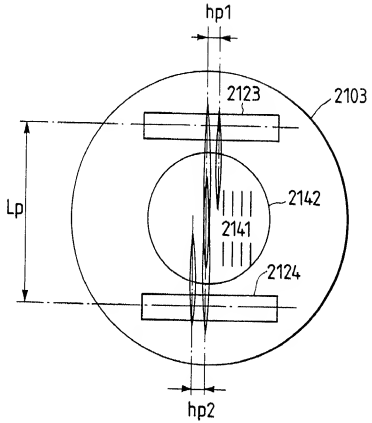


FIG. 34(b)

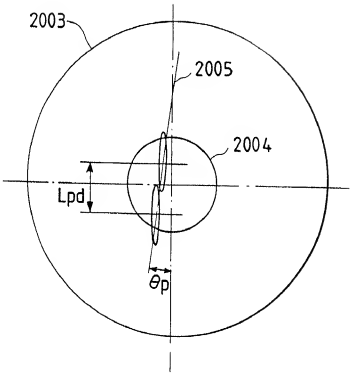


FIG. 35

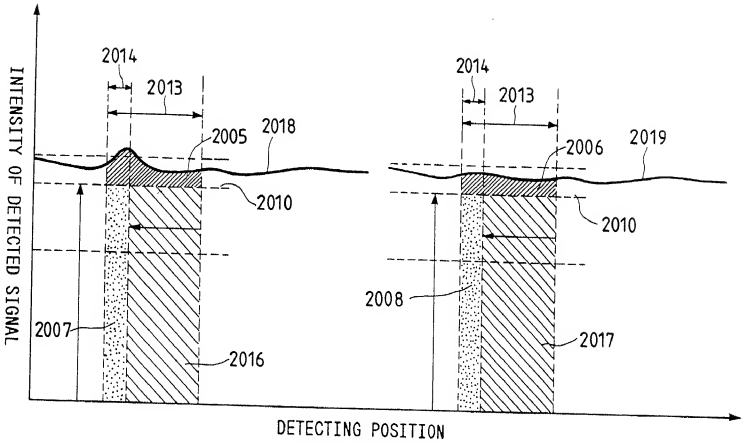

2014
2013
2005
2018
2010
2007
2016
2014
2013
2006
2019
2010
2008
2017
INTENSITY OF DETECTED SIGNAL
DETECTING POSITION

FIG. 36

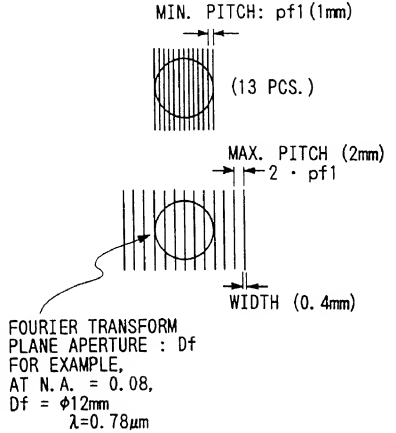
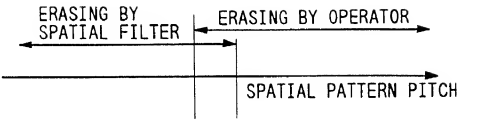


FIG. 37



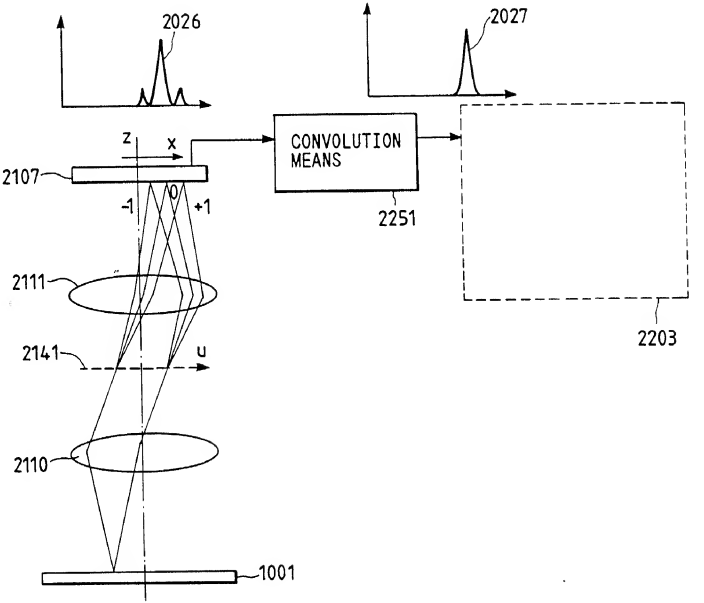
pf1(mm)	L1(μm)
0.6	100
0.8	75
1.0	60
1.2	50

EASY TO MANUFACTURE

HIGH RATE OF DETECTION AREA

SCANNED, #24

FIG. 38



TOSHIBA 001C0060

FIG. 39A

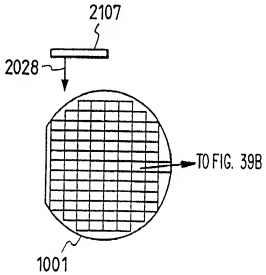


FIG. 39B

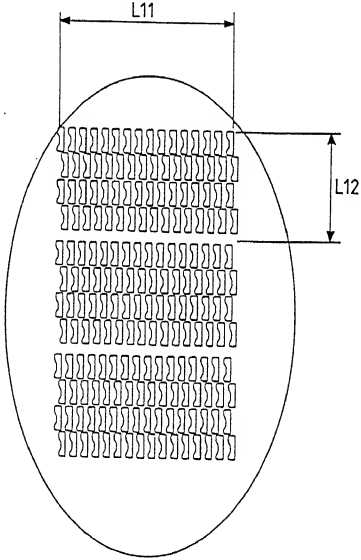


FIG. 40

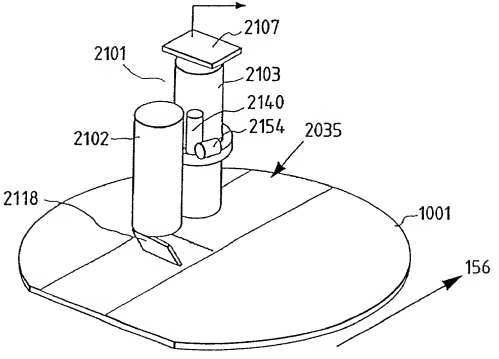

2107
2101
2103
2140
2154
2035
2102
2118
1001
156

FIG. 41

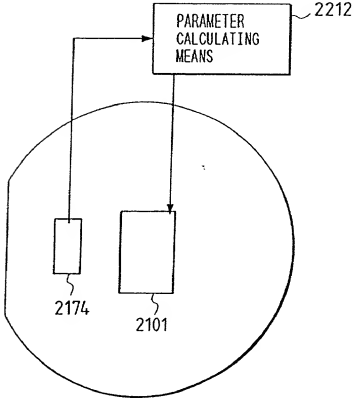

PARAMETER CALCULATING MEANS
2212
2174
2101

FIG. 42(a)

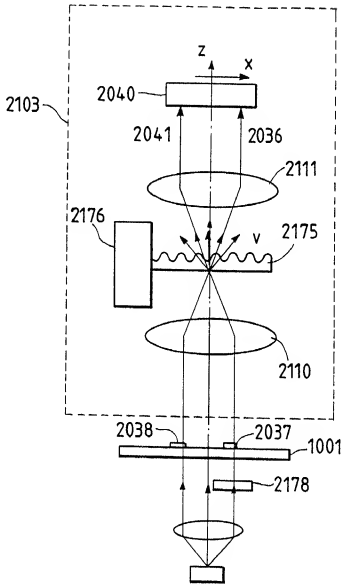


FIG. 42(b)

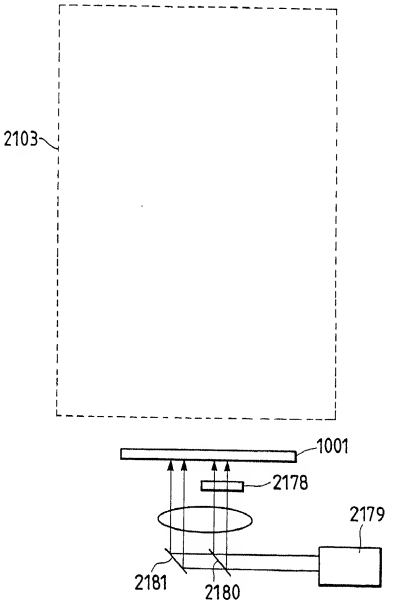
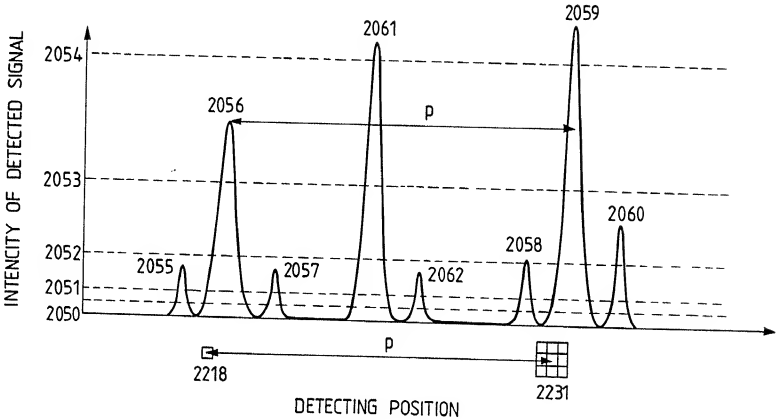


FIG. 43


INTENCITY OF DETECTED SIGNAL
2054
2053
2052
2051
2050
2061
2059
2056
p
2060
2058
2055
2057
2062
p
2218
2231
DETECTING POSITION